

PATENT SPECIFICATION

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 (72) Inventor JOHN ANTHONY BANHAM

(19)



(54) IMPROVEMENTS IN OR RELATING TO DOOR FASTENING UNITS

(71) We, BANHAM'S PATENT LOCKS LIMITED, a British Company, of 233—235, Kensington High Street, London, W.8, do hereby declare this invention for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to door fastening devices for use in conjunction with locks incorporating a bolt that is moved to an extended position to effect locking. Such devices provide bolt members which are moved into the bolting position by shooting of the bolt of the associated lock, thus permitting the bolt members to be applied by a person locking the door from the outside.

According to the present invention a door fastening device comprises a casing that has bolt members mounted in it at mutually remote regions thereof to be each slidably guided between a retracted position and a projecting position, and actuating means disposed between the bolt members and extending towards the bolt members and adapted for engagement by a bolt of the associated lock, the actuating means being adjustably locatable relative to the casing to allow regulation of the position of said means in the direction of sliding movement of the bolt members, and said actuating means being connected to the bolt members in such a manner that displacement of the actuating means by the shooting of said bolt causes sliding movement of the bolt members from their retracted positions to their projecting positions.

The actuating means may comprise two levers extending towards opposite end regions of the casing, each lever being pivotally mounted, intermediate its length, within the casing and the levers being connected to respective bolt members at said end regions. Said location adjustment of the actuating means may then conveniently be arranged to be carried out by variation of the pivot positions of the levers.

By way of example only an embodiment of the invention will now be described in greater detail with reference to Figs. 1 to 10 of the drawings accompanying the Provisional Specification and Fig. 11 of the accompanying drawing, in which:—

Fig. 1 is a side view of a door fastening device according to the invention for use with a door rim lock;

Fig. 2 is a front view in the direction of arrow A of the device of Fig. 1;

Fig. 3 is a side view of a cover for the device of Fig. 1;

Fig. 4 is an end view of the cover of Fig. 3;

Fig. 5 is a plan view of the cover of Fig. 3;

Fig. 6 is a side view of an attachment for the cover of Fig. 3;

Fig. 7 is an end view of the attachment of Fig. 6;

Fig. 8 is a section on the line VIII—VIII of Fig. 6,

Fig. 9 is a side view of part of the mechanism of Fig. 1,

Fig. 10 is a front view of the mechanism of Fig. 9, and

Fig. 11 is a perspective sketch illustrating the device and its cover in position on a door frame and the co-operating means on the door.

Referring to the drawings, the device comprises an elongate, open-fronted casing 2 including a bottom plate 4 and a top plate 6. Each plate 4, 6 has, adjacent each end thereof, first and second horizontal slots 8, 10, and each plate also has a pair of arcuate slots 12, 14 disposed inwardly of said end slots. In addition the top plate 6 contains a central recess or aperture 16 opening into its front edge. Front flanges 18, 20, integral with and one at each end of the side plate 4 are bent over to extend across each end of the open front of the casing 2, each flange containing a rectangular slot 22.

Mounted on the casing 2 are two levers 24, 26 each having an elongate hole 28 formed adjacent the outer end thereof and each carrying, at the inner end thereof, a striker portion comprising a laterally-

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extending, flat element 30 projecting through the aperture 16. In each lever, between the hole 28 and the element 30 is an aperture 32, which may be formed as a hollow boss, providing a pivot for the lever.

Connected to the outer ends of the levers 24, 26 are bolt members 34, 36 for which purpose slots 38 in the rear ends of the bolt members receive the ends of the levers, and connecting pins 40, 42 pass through the bolt members and the holes 28 in the levers as shown in Figure 10. The pins 40, 42 extend from both sides of the members 34, 36 to seat in the horizontal slots 8, 10 in the plates 4, 6 which thus act as guides for the rectilinear sliding movement of the bolt members.

Using the apertures 32, the levers are themselves mounted in the casing by means of tubular pins 44 that sit in the arcuate slots 12, 14 in the plates 4, 6. The pins are slidable along the arcuate slots and can be secured at any required position in these slots as will be described in more detail below.

In the inoperative position of the device, as illustrated in Figs. 1 and 2, the bolt members 34, 36 are urged into a retracted position by respective compression coil springs 46 co-acting between the inner faces of the flanges 18, 20 and extensions 48 formed on the rear of the bolt members themselves. In this condition, as is shown in Fig. 1, the pivot pins 40, 42 are located at the rear ends of the slots 8, 10 while the forward ends of the bolt members extend through the slots 22 to the front of the device for only a short distance. The distance of the elements 30 from the front face of the device is determined by the position of the tubular pins 44 within the arcuate slots 12, 14.

The device described above can be mounted to the inner face of a door frame F, adjacent the inside edge of the frame, by means of three screws passing through tubular support studs 50 which extend between the plates 4, 6 and which themselves serve to secure the plates together. The support studs 50 do not lie on a straight line to give a firmer attachment to the door frame.

The device is positioned so that the bolt B of an associated lock L carried by the door D, when shot to a locking position, engages the elements 30. For this purpose, the tubular pivot pins 44 are moved along the arcuate slots 12, 14 to pivot the levers about the pins 40, 42 until the elements 30 are located as required relative to the bolt of the lock for the levers to be pivoted by the shooting of the bolt to the extent needed for satisfactory operation. Screws are then inserted through the tubular pins 44 into the door frame thereby fixing the pivot centres of the levers 24, 26 at their chosen positions.

With the device so positioned on the door frame, on actuation of the lock on the associated door the bolt of the lock bears on the elements 30 and pivots the levers 22, 24 about the now fixed pins 44, such movement causing the bolt members 34, 36 to slide from the retracted position substantially within the casing 2 to a locking position in which they extend from the casing and across to the inner face of the door where they may be received in box staples or cleats secured to that face of the door. The bolt members are guided in this movement by the sliding engagement between the pins 40, 42 and the slots 8, 10 and by co-operation between the members themselves and the slots 22. On release of the lock, the springs 46 serve to return the bolt members to their retracted positions with a corresponding return of the levers 24, 26 to the inoperative position shown in Fig. 1.

Thus there is provided an arrangement in which variation in the gap between the door and the frame, which would affect the extent of projection of the bolt of the lock on the door across the frame, can be allowed for by adjustment, not of the fastening device as a whole, but of the positions of the levers 24, 26, only. The device can thus be mounted on the frame in a predetermined position relative to the inside edge of the frame, which has advantages in terms of ease of fitting and security, as will appear below. To try to achieve this without allowing for adjustment of the positioning of the elements 30, the presence of a larger gap between the door and the frame might reduce the effectiveness of the bolt members 34, 36 which would not be moved to a fully extended position when the door lock bolt is shot.

The location of the pivot pins 44 in relation to the bolt members 34, 36 and the elements 30 is such as to provide a movement of the bolt members greater than that of the elements 30. In this example, there is a 2:1 ratio of bolt member movement to main bolt movement. Thus, the residual movement of the lock bolt, after it has passed the gap between door and frame, is sufficient to generate the required full movement of the bolt members.

The mounting of the device to the door frame is by the driving of screws into that face of the frame that is visible when the door is closed, which facilitates the alignment of the device to the door lock longitudinally of the gap between the door and the frame. Such mounting screws could be relatively easily tampered with, however, and thus once the device is secured to the door frame there is positioned over it a cover generally indicated at 52.

This cover is in the form of a trough with

closed ends but with longer faces of unequal width, the wider face projecting beyond the level of the closed ends and forming a front piece 54 containing four screw holes 56 (Fig. 3) permitting attachment of the cover to the inside edge of the frame. The front piece 54 also contains two slots 58 for the passage therethrough of the bolt members 34, 36, which they fit closely. The central portion 62 of the front piece of the cover is recessed, as shown in Fig. 5 and has formed therein a central slot 60 to receive the bolt of the lock. two screw-holes 64 and an elongate screw hole 66. The holes 64 are themselves contained in elongate recesses 65 in the central portion 62.

The cover is positioned vertically on the door frame to enclose the door fastening device and so that the bolt members 34, 36 can pass through the slots 58 in the front piece, which can conveniently be done with the door open and the bolt members extended sufficiently to locate the cover which is then fixed in place by screws passing through the four holes 56. The main bolt of the lock is able to pass freely through the slot 60, which provides a substantial clearance for the lock bolt so that the positioning between the bolt and the cover 52 is not critical at this stage.

A striker plate 68, illustrated in Figs. 6 to 8, is adapted for attachment to the cover 52 at the recessed portion 62 to provide a registering aperture for the lock bolt. The plate includes a slot 70, narrower than slot 60 of the cover, to conform with the dimensions of the bolt of the lock so that when inserted through it, the bolt fits the aperture closely. Also formed in the plate are two elongate screw holes 72 each in a flanged recess 74, and a further screw hole 76. The front edge 78 of the plate 68 is bent back over as shown in Fig. 7 for co-operation with the door bolt when it is spring-latched.

After fixing the cover 52 in place, the striker plate is positioned in the recessed portion 62 of the front piece 54 by screws passed through the elongate holes 72 and the associated holes 64 in the casing, the flanges 74 in the recesses 65 surrounding the holes 64. These elongate holes 72 allow some adjustment of the position of the striker plate so that when the lock bolt is shot into the slot, the door is held in its fully closed position in the door frame, without any significant gap or play in the direction of closing movement. The lock bolt is then retracted and while the plate is retained in the same position, the door is opened and a screw is inserted through the hole 76 to fix the plate 68 in that position, the screw passing through the elongate hole 66 in the cover. The screws in the holes 64 and 72 can then be tightened down.

The above arrangement of elongate and circular screw-holes in the cover 52 and striker plate 68 is advantageous for a number of reasons. The elongate hole 66 ensures that there is no obstruction to the associated screw entering the wood of the door frame irrespective of the setting position of the striker plate on the cover. The circular, recessed hole 64 ensure that the associated screws passing through the holes 72 are inserted in a fixed position in the door frame regardless of the initial setting position of the plate 68, with the result that if an attempt is made to force open the locked door and the lock bolt is urged against face 80 of the slot 70 of the striker plate with such force that the screw in the holes 66 and 76 shears, the striker plate slides back to a position where the ends of the holes 72 in the plate come into contact with the screws through them. The dimensions of the holes 72 relative to the slot 70 is so chosen that when this position is reached, the door face will have come into contact with the adjacent faces of the auxiliary bolt members 34, 36, (some clearance is provided in normal use for trouble-free operation) and the lock bolt will have also come into contact with the edge 82 of the slot 60 in the cover. Thus the pressure on the door is resisted jointly by the lock bolt and the bolt members, the forces upon which are taken by the screws through the holes 64 and 72 fixing the striker plate, the screws through the holes 56 fixing the cover 52 and the screws through the holes 44 and 50 fixing the casing 2.

WHAT WE CLAIM IS:—

1. A door fastening device for use in co-operation with a door lock and comprising a casing, bolt members mounted in the casing at mutually remote regions thereof to be each slidably guided thereby between a retracted position and a projecting position, and actuating means disposed between the bolt members and extending towards the bolt members and adapted for engagement by a bolt of the associated lock, the actuating means being adjustably locatable relative to the casing to allow regulation of the position of said means in the direction of sliding movement of the bolt members, and said actuating means being connected to the bolt members in such a manner that displacement of the actuating means by the shooting of said bolt causes sliding movement of the bolt members from their retracted positions to their projecting positions.

2. A device according to claim 1 wherein the actuating means include two levers extending towards opposite end regions of the casing and engageable by the lock bolt, each lever being pivotally mounted intermediate its length within the casing and

the levers being connected to respective bolt members at said end regions.

3. A device according to claim 2 wherein said location adjustment of the actuating means is arranged to be carried out by variation of the pivot positions of the levers.

4. A device according to claim 3 wherein the pivotal mountings of the levers comprise apertures for the passage of members attaching the levers in place to determine said pivot positions and providing mountings on which the levers can pivot.

5. A device according to any one of claims 2 to 4 wherein the levers are pivoted on axes that are spaced further from the bolt member connections than from the regions of engagement of the levers by the door bolt.

6. A device according to any one of the preceding claims further comprising a receiving means for the passage of the lock bolt, said means being adjustable relative to the casing to determine the position of engagement of the lock bolt with the actuating means transverse to a plane of the sliding movement of the bolt members.

7. A device according to claim 6 wherein said receiving means comprises a striker plate for the lock bolt having an aperture smaller than and overlying an aperture in a cover of the casing and being securable to said casing cover.

8. A device according to claim 7 wherein the striker plate is capable of displacement on the casing cover away from said plane of movement of the bolt members while remaining attached to the casing cover, to bring respective edges of the overlying apertures that are the edges more remote from said plane of movement into registration with each other.

9. A device according to any one of the preceding claims wherein guides are provided to give the bolt members rectilinear movement paths in their sliding displacement.

10. A device according to any one of claims 2 to 8 together with claim 9 wherein each lever is connected to its bolt member

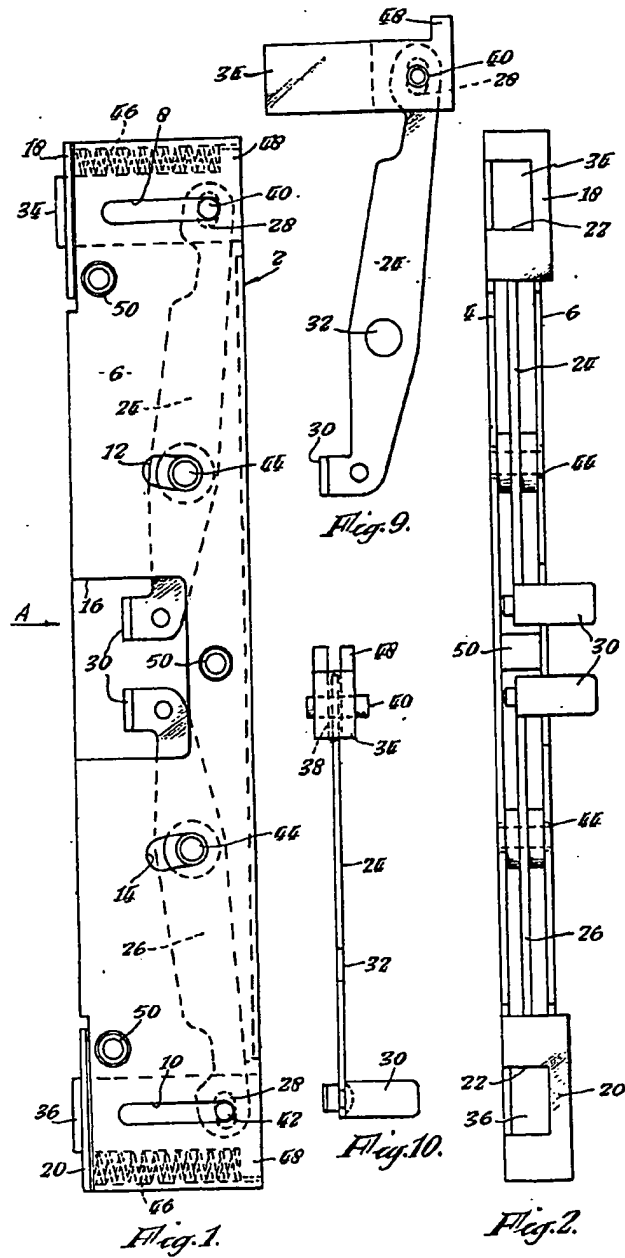
by a pin that is located in a guide slot for said rectilinear movement and an elongated aperture in the lever receives the pin so as to permit relative movement between the aperture and the pin in a direction transverse to the direction of movement of the bolt member.

11. A door fastening device for use in co-operation with a door lock having a bolt that can be shot to extend between a member of a door frame and a door fitting an opening in said frame, the device comprising a casing, screw means engageable with the inside face of a member of the door or frame to secure the casing to said face, bolt members mounted in the casing at mutually remote regions thereof, guide means acting on the bolt members constraining them to slide from a retracted position to an extended operative position, actuating means connected to the bolt members and arranged to be engaged by said bolt of said associated lock in such a manner that engagement of the actuating means by the shooting of said bolt causes said sliding movement of the bolt members from their retracted positions to their extended operative positions, attaching means passing through said actuating means to locate them adjustably relative to the casing and to secure them directly to said inside face, a cover enclosing said casing and actuating means, screw means being provided to secure the cover in position, said screw means being engageable with an edge of said member of the door or frame that is hidden when the door is closed.

12. A door fastening device constructed and arranged for operation substantially as described herein with reference to Figs. 1 to 10 of the drawings accompanying the Provisional Specification and Fig. 11 of the accompanying drawing.

MEWBURN ELLIS & CO.,
Chartered Patent Agents,
70/72 Chancery Lane,
London WC2A 1AD,
Agents for the Applicants.

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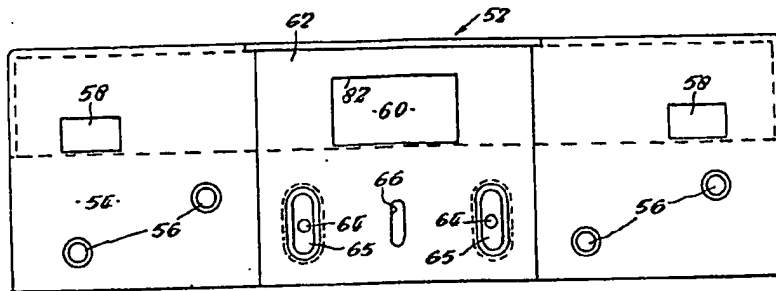


Fig. 3.

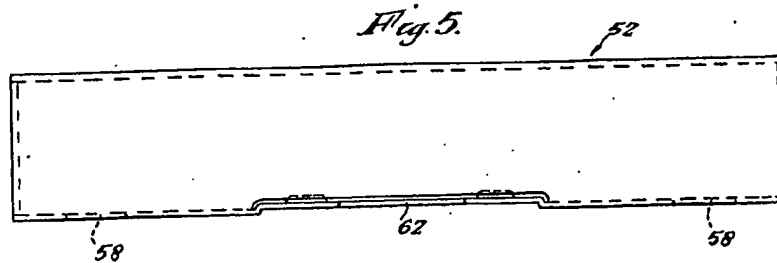


Fig. 5.

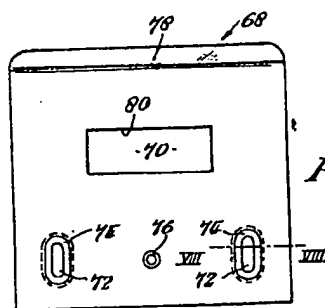


Fig. 6.

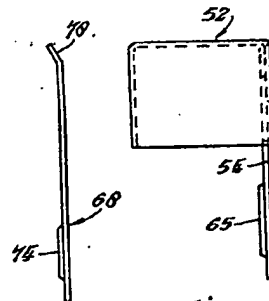


Fig. 4.

Fig. 7.



Fig. 8.

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COMPLETE SPECIFICATION

1 SHEET

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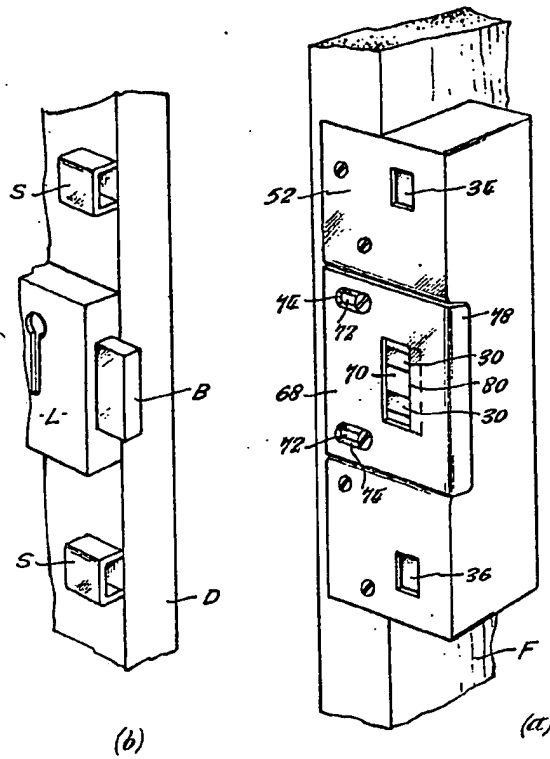


Fig. 11.

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